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Book

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WESTERN PECAN NURSERY



Fifty-seven Matured Nuts on One Stem

R. A. HARRIS
MANAGER AND OWNER

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RIVERSIDE, CALIFORNIA

FOREWORD

This little booklet is written to answer the many questions that are being asked me continually. Read it carefully and I believe you will get the knowledge of how and where to grow this most valuable of all trees.

My life has been spent almost wholly in horticultural pursuits. I have at sometime or another had to do with every branch of this work. A large amount of my time of the last 25 years has been in adapting new species and varieties to new locations of the Southwest. California, Arizona, New Mexico and extreme West Texas. I believe I have successfully introduced and adapted more species and varieties to these locations than any other man or set of men. From a lifetime spent in horticultural work I do not hesitate to state that the pecan is the most valuable tree to mankind that grows. I want you to plant some of them if you have suitable conditions. But I want you to be very careful to plant the right kind in the right way.

R. A. Harris.

Growing the Pecan By Irrigation

The growing of the Pecan by partial irrigation is practiced to some extent in states other than those lying west of the Rocky Mountains and while I believe there are few places where the pecan is grown commercially, that this practice could not be extended profitably, I will in this booklet deal specifically with the States of California, Arizona and Nevada, although the principle and methods are adaptable to other localities, when soil and climate conditions are considered.

I have had to do with the pecan for more than forty years. The last ten years of this period I have given almost exclusively to finding adaptable root stock and suitable commercial varieties for this Western Section. I now have growing on my place here at Riverside, California, thirty varieties of pecans, coming from all the important pecan growing sections of the United States. These comprise about three hundred trees and range from producing trees to small ones transplanted the last two years. There are many of the latter.

Much of my planting has been experimental, and I have dug out many trees after trying to grow them for several years as they were not on adaptable root stock, and had no chance of ever supporting profitable trees of capacity and vigor.

I have changed many of my trees to more suitable varieties by budding them over but where the root stock was not right there was no other way but to take my loss in time, money and use of the land, and begin all over again with root stock that I had proved to have the capacity, and was adapted to climate and the methods we have to follow in this hot, dry, irrigated section.

IMPORTANCE OF ROOT STOCK

I cannot impress it too forcibly upon the prospective planter that the nature and vigor of the root stock is of much greater importance than the bud stock. The root stock is the foundation on which you build the tree, and if this is not right you have no show of making a successful tree, as it has not in its makeup the inherent capacity and adaptability.

Why does one tree growing in our pecan forests produce a thousand pounds of pecans at a crop and no other tree near it one tenth as much, although many of them are as old or older and all growing under the same conditions? Is not this because of inherent capacity? I think it is, and I want the root stock for my trees of this nature.

Of course the climate in which a tree is propagated will have a lasting influence as to its success or failure when transplanted. Some may have a greater climate range than others, but none will give maximum returns in regions much different from its original home. This has been proven time after time and one would be foolish to transplant in an arid climate trees originating in a humid area.

After searching for many years for suitable root stock for this hot dry irrigated section, I have finally found what I believe is just what I have wanted. I have been using this stock for several years here also throughout the states of California, and Arizona, and so far, from the thousands of these trees I have used, have not had a single complaint, nor do I know of any trees that have not lived and those I have observed that have been given intelligent care have made splendid development.

IRRIGATION

The pecan tree, to do its best, must have ample moisture at the root. I do not know of any other tree that can use so much water profitably as the pecan. I have made the statement in other publications, that the quantity of moisture a tree can profitably use is the measure of its capacity for production. Soil food must be in complete solution before the tree can use it and the more moisture the tree can profitably handle the more food goes into the tree, and the more food the greater the production.

This is the reason that ideally located pecan trees have produced a ton of nuts in a single crop, worth as much, measured in calories for human food as 3½ tons of the best beef steak. Do you know of any other living thing that can in a single year do this? The production of perfect nuts and maximum yields depends upon the moisture available at certain periods of their development, taking it for granted that your soil has good drainage; not an open sandy sub soil, but a soil that will in a few days drain off an over abundance of surplus moisture. Many of our clay subsoils will do this and will prevent the soil food from being leached away. My subsoil is a rather heavy gravelly clay and lays in strata from the third to fourth foot. Below this to a depth of 40 or 50 feet it is a very fine friable sandy loam. Taking my place as an example, other soils may be judged regarding the amount of moisture required. Heavy soils hold moisture longer than lighter soils.

Our normal rainfall here is about 10 inches, which almost all comes in the winter months. If we have had during these late fall and winter months as much as 8 inches, I do not irrigate until about March 1st but if our rainfall has been much below our average amount, about Feb. 1st I irrigate in quantity enough or more to bring the moisture in the soil up to or somewhat more than it would have been if the rainfall had been normal. I have used at this time with good results, as high as 10 acre inches. One miners inch of water running 50 hours, will give close to one acre inch, or the reverse; 50 miners inches running one hour will give one acre inch. I have run 50 inches two days on 5 acres, which gives a little less than 10 acre inches, if all could be put into the land without any loss from run off, which of course cannot be done. But I have very little run off; not over 10 per cent. My method of getting so much moisture into the ground I will give later on.

BLOOMING PERIOD

The second irrigation depends upon when the first one was given, but is usually about six weeks later than the first one. If the first one was about March 1st, the second should be given about April 15th. This irrigation is only 5 acre inches and comes a

little before the staminate bloom starts to put out, which here is from the 15th of April to 5th of May. This irrigation provides the tree with ample moisture to carry and perfect this bloom and to push the leaf growth to sufficient length to put out a good pistillate bloom, which forms after the terminal shoots have grown from 6 inches to a foot in length



Cluster of 67 Nuts in an Area 2 Feet Square, Growing in Riverside

and follows the staminate bloom ten days to two weeks or more. It is important to have ample moisture preceding the staminate bloom to furnish and perfect the pollen so it matures at the time the pistillate bloom is ready to receive it. This irrigation also comes at a favorable time to push the terminal twig growth that the pistillate bloom spring from and is far enough in advance of this latter bloom that there is not an excess of moisture at this time, which if there were too much moisture might push off a proportion and lessen the crop.

The weather here in late April and early May is generally cool; mean average 60 to 65 degrees. The pistillate bloom develops slowly and is receptive to pollen for a period of 10 days to two weeks. This is very favorable for a heavy set of nuts as the weather at this time is quite dry and pollen can be blown during almost all this time, insuring almost a full fertilization of the pistillate bloom.

I have been very particular to make this as plain as I can as this is the starting of the crop, and large crops depend upon well timed irrigations.

DEVELOPING SIZE AND PLUMPNESS

The next period the nut is developing in size. This can only occur while the shell is soft. After the shell hardens the nut will not grow any larger and lack of moisture during this period will cause the shell to harden earlier and stop size growth of the nut. The time the nut is getting size here is from the 10th of May to almost if not quite to the

last of September. Some years if we do not have our average summer heat, it may extend to Sept. 15th. So the next irrigation should come about five weeks after the second, or the 20th to 25th of May. This and following irrigations are the same amount; 5 acre inches. June here is usually quite hot; mean temperature about 71 degrees with some days apt to go as high as 110 to 114. Moisture is transpired by the tree very rapidly at these high temperatures and it would not be safe to have irrigations too far apart. And supposing the last one was May 25th; the next one would probably be better to come by June 20th; same amount as last one. July and August are also as hot or hotter than June, so time irrigations accordingly; say July 15th and August 10th. This last irrigation should complete the growth in size of the nut and the shell by September become quite hard. But we cannot lessen our irrigation, as the next period the nut is perfecting the kernel, especially in plumpness, and must have ample moisture. So on Sept. 1st to 5th give a like irrigation, and on October 1st to 5th another.

By this time the kernel should be plump and well developed.

FINAL PERIOD

The next period the nut is toneing up(developing quality.) This period is the only one that does not require abundant moisture and six weeks should ordinarily be allowed from previous irrigations; say about Nov. 15th, same amount of irrigation. This is the last irrigation and is very important as it causes the husks to crack open, letting the nut fall of its own weight to the ground. Also this irrigation coming after the nut has matured or nearly so, the tree turns its efforts to maturing strong buds for the growth of tree and crop for next year and must have sufficient moisture to do this. If best crops and finest nuts are to be had the tree must be kept functioning properly during all these periods. If at any period moisture is neglected this will affect the particular development of that period. Lack of proper pollenization, which lessens the crop; lack of maximum size, owing to the tree not having plenty of moisture at some time of this period; lack of plump kernels or only partially filled shells because moisture was short during some of this period; lack of quality because moisture was not regulated nicely during this time, and lastly, hulls sticking to the nut, causing many to be of second quality because there was not ample sap flow in the tree from lack of moisture to cause them to break open and release the nut. Also poorly matured buds for next year's crop. All these or some of them may happen just because the tree needed a drink at certain times and failed to get it until the damage was done. It will be noted if the number of irrigations I give my trees is computed that the amount of water that is used per year is from 50 to 60 acre inches. This amount if timed properly should be sufficient in most soils.

STUDY YOUR CONDITIONS

Every orchardist should have a soil auger that he may know moisture conditions at all times and the nut orchards need one most of all, and a longer one. It should be able to reach at least 8 feet in the soil

and 10 feet is better. All soils differ. Also seasons vary. So no set rule based upon one type of soil or season can be applied to every other soil or season. Use the soil auger often and cut a nut in half a few times and by careful attention and a little judgment you can learn your own conditions and requirements.

APPLYING THE WATER

The method of spreading the water is not of so much importance as getting it deep into the ground. Some of the lighter soils will allow the water to penetrate deeply from its own weight in a short time and generally speaking will loose its moisture in a relatively short period. As stated before, my soil especially from the third to fourth foot, is a rather heavy clay. Above and below for a great depth it is a good sandy loam. The problem with this soil is to get the water quickly below the fourth foot. The clay stratat that stops the penetration might be broken up with a subsoil plow to this depth but would quickly be packed together by the clay settling back in its former place. Blasting would no doubt act in the same way, so some other method that would keep this passage constantly open to quick penetration had to be devised. I have accomplished this by the use of a 4 inche soil auger. When I plant the tree I bore a hole directly under where the tree is to stand. Through this clay strata, I refill this hole with the best top soil containing a good proportion of leaf mould or finely pulverized barnyard manure. If I use manure, I am careful to not fill so the tree roots will touch it for a considerable time after it commences growth. The next irrigation after the tree is planted I bore two more holes where the furrow will come and fill them the same as first hole was filled. These two holes are about 18 inches from the tree. Later I bore other holes but always farther from the tree. In this way I quickly get the water to considerable depth and have very little run off. Yes, it is considerable work but if one wants a valuable orchard he must expect to work. And if he is not willing to give his trees the care they need he had better never start. I can bore and fill from ten to fifteen holes an hour to a depth of four feet. Fifteen holes would probably be sufficient for a tree ten years old, and the difference in the crop of one tree at this age from one that had only ordinary care would pay for boring 500 to 1000 such holes. There would probably be this difference: Every year for the life of the tree, and the age a pecan tree will live and produce heavy crops has not been determined, but undoubtedly is for several hundred years.

CULTIVATION AND FERTILIZATION

For the first few years after the tree is planted it should have light cultivation after each irrigation. It would be well to break up the land by shallow plowing in the early winter and left in a rough state until time for the first irrigation. A shallow rooting cover crop may be grown in either summer or winter if a strip six to eight feet wide is left unplanted for the tree. Of course where a cover crop is grown more water is required. A good crop is either beans or peanuts for summer or some of the clovers in winter. Many of our western soils do not require any fertilizer other than nitrogen

and plenty of vegetable matter. If two cover crops are grown each year this will add all the fertilizing and vegetable matter required. If this is not done, then some vegetable matter from other source should be added. Alfalfa hay, bean or peanut straw is good. Not less than two ton of vegetable matter to the acre should be supplied to the land each year and plowed under. Hay damaged from rain is as good as any.

IDEAL CONDITIONS FOR THE PECAN

As I have treated pretty fully in another chapter of soil conditions I will only touch lightly here on this phase of the subject. The soil must be a good agricultural soil for best results, or made so by adding vegetable matter. Light soils need more frequent applications of water. Heavy soils retain soil food and moisture longer than light soils but require more effort to get soil food and moisture to effective position for use by the tree. Personally I prefer the heavier soil types. The pecan is tolerant of considerable alkali, perhaps one per cent or more. The exact amount has never been determined but they are growing where there is perhaps one per cent in the first few surface feet. The roots will stop when they come to standing water or a considerable strata of quicksand. (A foot or more.) I would not plant largely where it was less than 5 feet to standing water and 8 or 10 feet is better. It is perhaps 40 feet to water on my place. This is no detriment, as I have ample irrigation facilities.

CLIMATE

It requires a certain amount of total heat units to mature any crop. Plants differ in this requirement, hence the different zones producing different plant growth. The pecan is tolerant of excessive heat over a long period of its vegetative state. Some of the finest pecans I have ever seen are produced on Mr. Tat's place at Yuma, Arizona. You all have heard of Yuma climate. Mr. Tate has ten trees that are 12 years old, growing in the silt soil of the Colorado river, in Bermuda sod. It is 8 feet 6 inches to permanent water; some alkali. These trees averaged over 60 pounds to the tree at 10 years from planting and 80 lbs. at the eleventh year. I do not know how much they yielded last year (the 12th.) But one tree from which I got nuts produced 125 lbs. What they produced previous to the tenth year I do not know as there was no record kept that I can base a statement upon, but they yielded good crops for their age I am told. These nuts are purchased in Los Angeles and bring Mr. Tate \$1.00 per pound. Mr. Tate expects to give more frequent irrigations from now on, which will no doubt increase his yields. In three or four years more they should produce twice as much and at 20 years from planting they should yield 250 pounds each at least.

The total heat units required to mature a crop may come in excessive amounts which will hasten maturity of the crop, or may extend over a longer period with lessened temperatures, but the crop will be longer maturing.

The same variety of pecan will ripen at Yuma around the first of October but will not ripen here at Riverside until November. Some varieties do not

mature here until about the first of December, as our spring is later coming to growing weather, our summer nights cooler and day temperatures not so high. This is no drawback, as our pecan crop will come on when the walnut crop is all harvested and taken care of. Freezing weather in winter will not hurt the trees even if it gets to zero.

DEMAND AND PRICES

It is safe to say no matter how many pecans are grown the markets will not be supplied for a great many years, as they are not grown to any extent outside the United States. A very few are grown in Mexico and the finer kinds are not grown at all outside the United States. So far, comparatively few of these are grown here. This is about the newest of the horticultural crops, it being only about 20 years since these finer sorts were propagated for decemination. They have the whole world for a market and no competition. Very few have ever been shipped out of the United States to date. So far, they have mostly sold to a fancy market. The prices for the best sorts are three to four times as much as our English walnuts.

Considered from their delicate flavor and highly pleasing texture one does not wonder at the price. Very few people have ever eaten these finer sorts, and when pecans are spoken of most people think about the polished and sloped over pecans that supply our general markets, thick shelled, indifferent flavor and hard to extract from their shell. The finer sorts are the reverse of these in every particular.

VALUE OF A PECAN ORCHARD

The value of a pecan orchard depends upon several factors. First, the climate and soil must be suited to this tree. Second, adaptable varieties worked upon productive, congenial root stock must have been planted. Third, intelligent care must have been given.

In no other kind of purchase is the quality of the article of such vital importance as in nursery stock. And particularly pecan stock. The price of a tree is the smallest part of its cost by the time it has come into bearing. Expect to pay a fair price, but be sure you get the very best stock to be had. Purchase your stock from reliable, well-known nurserymen. They should have a reputation for reliability in their line of work and be permanently located. Be assured of their standing before investing your money. Many have lost several years time, the use of

their land and many times the original cost of the trees by purchasing of unreliable people.

Taking Mr. W. D. Tate's trees at Yuma as a concrete example, these ten trees at 11 years from planting produced an average of 80 pounds to the tree. These nuts sold for \$1.00 per lb. or \$80.00 per tree. Any investment that pays 10 per cent is considered a good investment. Eighty dollars is 10 per cent on \$800.00 which on this basis represents the value of one tree and the ground it occupies. Placing these trees 40 feet apart would give 27 trees to the acre and if the whole acre carried out

this average of \$80.00 per tree an acre would yield 2160 pounds and at \$1.00 per pound would bring \$2,160.00. This is 10 per cent on \$21,600.00 or what one acre of such trees would be worth. Can anyone disprove this reasoning? You can cut this in half, a third or even one-fourth and it still remains a high return for an acre of ground. Remember this is for eleven-year-old trees.

PLANTING

I like to plant here around the first of the year, but have planted as late as March 15 with good success.

Dig holes as deep as roots are long, which with these heavy lateral rooted trees is seldom over 30 to 36 inches. Do not make hole any larger than necessary to receive the roots comfortably when spread to their natural position. If substrata is hard or heavy soil, bore a four-inch hole directly under where tree will stand to soil that will in a reasonable time drain off any surplus water. Fill this drainage hole with the best top soil, or soil mixed with manure. When tree is set in the hole fill slowly with best top soil which may be had from surface soil around the tree. Throw away all but best soil. Spread the roots to natural position and be sure you do not bruise them. Settle dirt with water if available. If not, tamp soil thoroughly as you fill the hole up.

To make growth, the soil has to be in about the same condition as it was before it was dug up. While our trees will live and do well if little or no pruning is done at planting time, it is safest to cut off about one-third the growth above the place where it has been budded. You will know this place by the crook in stalk of tree.

HEALTHFULNESS OF THE TREE

The pecan is one of the healthiest trees that grows anywhere. Of course there are varieties not adapted to certain localities that will show distress in several ways owing to this.

There are some insect pests that work on this tree, some years in some places but I do not know of any west of the Rocky Mountains. Purchasers should be very careful where they purchase their stock on this account. Trees and packing material should be closely inspected. Purchase from reliable nurserymen that can show a clean bill of health, by certificate from their state and who have also been granted permission by our State Horticultural Commissioner to ship their stock into this state. Anyone not doing this should be kept out. These certificates will be attached to every shipment you purchase from us. Very few pecan nurseries will be prepared to do this.

We would like to get your order and guarantee we will furnish you the best rooted pecan trees that it is possible to grow. The buds are selected from the best trees of the varieties to be found. There is no better stock to be had and I do not believe there is any nearly as good.

HOW TO ORDER

I have made arrangements with the Starr Nursery Co., of Arp, Texas, which is a specially formed company, to grow special purpose stock and is owned by the Texas Pecan Nursey of that place to grow this class of stock for me. I have exclusive rights for this stock in California, Arizona and Nevada and it makes no difference whether you order of the Starr Nursery Co., Arp, Texas, or through the Western Pecan Nursery of Riverside, California, you will get this same stock in either case. These people have developed a system of growing heavy rooted stock that is by far the best I know of. They seem to have ideal conditions for this purpose and by the use of the specially selected nuts for planting, a stock is developed that will give the best possible results in our hot, dry sections.

Order your trees from the Western Pecan Nursery or send your order direct to the Starr Nursery Co., at Arp, Tex. To assure getting your trees in the sizes you want, your order should be sent in early. Many order their trees a year ahead of the time they expect to plant. This assures your order being filled. Late orders may not be able to get what they want, on account of all being sold.

To assure your order being filled, order early and send 25 per cent of the cost of the trees. When the trees are shipped their roots will be packed in wet shavings or sawdust and the tops wrapped in prairie hay; and guaranteed to reach you in good condition. They will come C. O. D. for the balance of the amount of their cost. You pay this when they arrive, and the express charges. Nursery trees should always be sent by express. Address: Starr Nursery company, Arp, Texas, or Western Pecan Nursery, Route 2, Riverside, Calif.

VARIETIES

Two or more varieties should always be planted.

SUCCESS

Though not the largest nut in existence, the kernel proved to be the heaviest in a test of fourteen leading varieties, made during a series of years. Ovate in form, with thin shell of splendid cracking quality; kernel very plump and heavy; flavor excellent; color bright and form fine. Tree of good sturdy growth, heavy bearer. Select nuts 40 to the pound; average 45; keeping quality the best.

Note: The ten trees referred to of Mr. W. D. Tate, of Yuma, Ariz., are this variety. Our trees are budded from original orchard.

SCHLEY

Size, large select nuts 40 to 45 to pound; Form oblong conical to long obovate, with conical apex. Shell very thin, cracking very easily; the kernels releasing without effort. Flavor, delicate, sweet and rich. This nut is considered by many people the best pecan and it sells in eastern markets higher than any other nut. It must have ideal conditions to do its best from a productive standpoint. I believe we can give this nut these conditions, and for our hottest sections I would recommend this variety.

and Success to be planted largely; buds from original orchard.

STUART

Size, large; average 40-55 to pound. In most sections of the east this variety is a prime favorite as it is a heavy producer. Here in Riverside it has proved a complete failure. The structure of the leaf is not suited to our extremely dry hot weather. It might do in more moist sections of the coast, where there is considerable fog.

DELMAS

Large to very large; 35 to 50 to pound. Early bearer in the east; quality very good. From its showing here, I cannot recommend it for hot sections.

—PRICES—F. O. B. ARP, TEXAS

Size of Trees	—Quantity—				
	In lots				Over
	1 to 24	25-49	50-100	100-500	500
2 to 3 feet.....	\$1.25	\$1.20	\$1.15	\$1.05	\$1.00
3 to 4 feet.....	1.50	1.45	1.40	1.30	1.25
4 to 5 feet.....	1.85	1.80	1.75	1.65	1.50
5 to 6 feet.....	2.50	2.45	2.35	2.25	2.10
6 to 7 feet.....	3.50	3.40	3.25	3.00	

Please Write Plainly.
Better prit name and address.

Make orders out on separate sheet. State when you want shipment made.

One fourth of the amount of order should be sent to insure that trees will be reserved. In case we cannot fill orders on account of being sold out, your money will be promptly returned.

Your for more pecans,
R. A. HARRIS,

Manager and owner, Western Pecan Nursery.

Route 2. Phone 2237 Riverside, Cal.





Stuart



Success

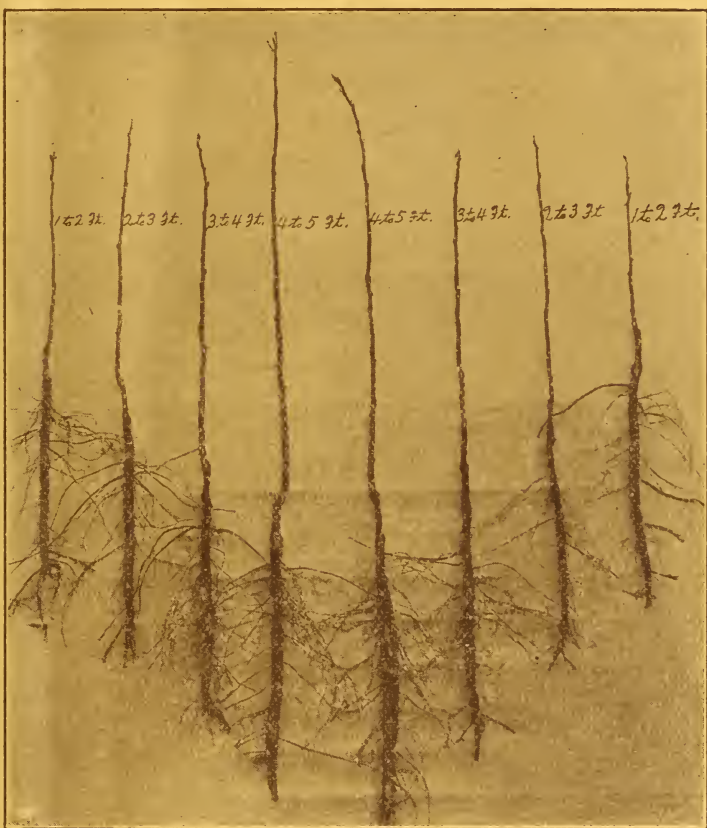


Schley



**The Root System
We Grow.**

**The Kind Most Others
Grow**



Some of Our Trees Six Months After Budding.

You can not improve on these trees. If they had remained until end of year they would have been larger, both top and root.



Four Year Old Tree

On place of author. Maturing about two pounds of fancy nuts. As a large stately shade tree the pecan has no superior. It is the cleanest tree I know and you get the nuts. Why not harvest something besides leaves?